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PTO/SB/01 (12-97)

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| <b>DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION</b><br>(37 CFR 1.63)  | <b>Attorney Docket Number</b> | DIGI8  |
|   | <b>First Named Inventor</b>   | Duchesne   |
|   | <b>COMPLETE IF KNOWN</b>      |  |
|   | <b>Application Number</b>     | /  |
|   | <b>Filing Date</b>            |  |
|   | <b>Group Art Unit</b>         |  |
| <input checked="" type="checkbox"/> Declaration Submitted with Initial Filing | OR                            | <input type="checkbox"/> Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required) |
| <b>Examiner Name</b>  |                               |  |

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**RAID SYSTEM HAVING CHANNEL CAPACITY UNAFFECTED BY ANY SINGLE COMPONENT FAILURE**

the specification of which

(Title of the Invention)

☒ is attached hereto  
OR

☐ was filed on (MM/DD/YYYY)  as United States Application Number or PCT International

Application Number  and was amended on (MM/DD/YYYY)  (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed

| Prior Foreign Application Number(s) | Country | Foreign Filing Date (MM/DD/YYYY) | Priority Not Claimed     | Certified Copy Attached? |                          |
|-------------------------------------|---------|----------------------------------|--------------------------|--------------------------|--------------------------|
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☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

| Application Number(s) | Filing Date (MM/DD/YYYY) | <input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto. |
|-----------------------|--------------------------|--|
|                       |                          |  |

[Page 1 of 2]

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## DECLARATION

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I hereby claim the benefit under Title 35, United States Code §120 of any United States application(s), or §365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

| U.S. Parent Application Number | PCT Parent Number | Parent Filing Date (MM/DD/YYYY) | Parent Patent Number (if applicable) |
|--------------------------------|-------------------|---------------------------------|--------------------------------------|
|                                |                   |                                 |                                      |

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority sheet attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

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| Name              | Registration Number | Name | Registration Number |
|-------------------|---------------------|------|---------------------|
| William S. Ramsey | 32,715              |      |                     |


☐ Additional registered practitioner(s) named on a supplemental sheet attached hereto.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor: ☐ A petition has been filed for this unsigned inventor

|                      |   |                |  |             |          |                |             |
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| Inventor's Signature |  |                |  |             |          | Date           | X 2/16/2001 |

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☒ Additional inventors are being named on supplemental sheet(s) attached hereto

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# DECLARATION

## ADDITIONAL INVENTOR(S) Supplemental Sheet

|  |  |                                |  |  |  |                |  |    |  |   |  |          |  |           |  |                    |  |    |  |  |  |                     |  |  |  |
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☐ Additional inventors are being named on supplemental sheet(s) attached hereto

05765123 032001

[0010] U.S. Pat. No. 6,073,218 discloses an apparatus for coordinating multiple RAID storage array controllers' access to a single array of storage devices. Each of a number of storage array controllers process different I/O requests on an array of common shared storage devices. One storage array controller is designated primary with respect to the storage devices.

5 Concurrent access to the storage devices is coordinated by the storage array controllers.

[0011] None of the prior art RAID systems achieves the advantages of the present invention, that of preserving the channel capacity or speed of the system in the face of failure of a connector, storage unit, or storage array storage array controller, all with minimal redundancy of components and minimal cost. In particular, in this invention a single passive storage array controller is available to replace any one of two or more active storage array controllers when an active storage array controller becomes defective.

#### BRIEF SUMMARY OF THE INVENTION.

[0012] This invention is a RAID system which is able to function with undiminished channel capacity or speed despite the failure of any one component, with minimal redundancy of components. The system comprises  $n$  active storage array controllers,  $n$  arrays of storage units, each active storage array controller connected by at least one connector to one array of storage units, each active storage array controller controlling one or more arrays of storage units, and one only passive storage array controller. The passive storage array controller is connected by two connectors to each active storage array controller, and is able to control any one of the arrays of storage devices. In normal operation, each active storage array controller controls one array of storage devices. In the event of failure of any of the active storage array controllers, the passive storage array controller assumes the identity of the failed storage array controller and assumes